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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,297	05/02/2001	Kiyoshi Kumata	0717-0465P	3865
2292	7590	01/30/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			NGUYEN, CHANH DUY	
		ART UNIT		PAPER NUMBER
		2675		21
DATE MAILED: 01/30/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)
	09/846,297	KUMATA ET AL
	Examiner Chanh Nguyen	Art Unit 2675

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 08 October 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>15, 20</u> .	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment filed on October 8, 2003 and supplemental under 37 C.F.R 1.111 as well as declaration under 37 CFR 1.132 filed on October 28, 2003 have been entered and considered by examiner.

Information Disclosure Statement

2. The references listed on the Information Disclosure Statement filed on 05/06/03 and 11/19/03 have been considered by examiner; see attached PTO-1449.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann (U.S. Patent No. 5,185,667) in view of Nayar (U.S. Patent No. 5,760,826) and further in view of Juday et al (U.S. Patent 5,067,019; hereinafter briefly referred to as Juday).

As to claim 1, Zimmermann discloses an omniazimuthal visual system including an optical system (1-2) capable of instantaneously obtaining an image of at least 180⁰ view field area therearound and capable of central projection transformation for acquiring the image; see column 4, lines 49-59. Zimmermann teaches an image section (3) for converting the image obtained through the optical system into the image data (see column 3, lines 29-32). Zimmermann teaches that a computer (5-7) including an image transformation (6-7), a display section (display monitor 11) and a display controller (8-10, 12) as recited in the claim; see column 3, lines 25-48.

It is noted that the optical system recited in the claim is well-known in the art to receive an image of 360⁰ view field area (panoramic 360⁰ image) being central projection transformation for acquiring the image (i.e. polar coordinate transformed to rectangular coordinate, even suggested by Zimmerman (i.e. the first property of a fish eye lens is that the lens has a 2 π steradian field of view and the image it produces is a circle); see column 5, lines 13-15. It is noted that 2 π steradian field of view is equal to 360⁰ field of view. Moreover, examiner cites well-known feature an omniazimuthal visual system including an optical system (1-2) capable of instantaneously obtaining an image of 360⁰ view field area taught by Nayar. Nayar teaches back to back paraboloid-shaped reflector (i.e. hemispherical scene 730 and hemispherical scene 130) so that together

they constitute a spherical scene ; see column 9, lines 33-44. Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to have substituted optical system of Nayar to the optical system of Zimmerman so that the spherical scene or an image of 360⁰ view field area can be obtained.

The only thing different between Zimmerman, Nayar and the claimed invention is that the image transformation section (6-7) of the Zimmermann uses software similar to the related art (Figure 10) of the application to perform the transforming the image data into display data whereas the claimed invention uses hardware such as a buffer memory, an arithmetic/logic circuit, a lookup table and a CPU to perform the transforming the image data.

Juday teaches at least one buffer memory (50, 74, 24, 46) for temporarily storing the image data and the display data , an arithmetic/logic circuit (multiplier 30, 68, adder 42, 72) for performing coordinate transformed into display data , a lookup table of trigonometric function (34, 36) for use in the arithmetic/logic circuit (30, 68, 42, 72), CPU (computer 104) for controlling at least one buffer memory, the arithmetic/logic circuit and the table. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the hardware image transformation as taught by Juday to the software image transformation section of Zimmerman as modified by Nayar so as to provide a real time remapped image according to any one of a number of different remapping transformations; see column 3, lines 20-46 of Juday.

As to claims 2-3, Juday clearly teaches the transform image data including zoom function (magnification) or pan function for generating a perspective image; see column 14, line 40 through column 15, line 51.

As to claim 4, Juday clearly teaches the arithmetic/logic circuit is being formed only by linear operation circuit (adding or mutiplier circuits is linear operation circuit); see column 9, line 18-34 (it is noted that the equation (3) is linear equation).

As to claim 7, transforming the image into digital image data is taught by Zimmermann (see column 3,lines 28-31), even the reference of Juday teaches an analog to digital converter (6).

As to claim 8, the image section (programmable remapper 10) of Juday having expansion PROM (e.g., 142) for storing the image information. This reads on the an image recording section as broad claimed language.

As to claim 9, Juday teaches that "the Address Lookup Table 34 (and the Factor Look-Up Table 36) may be segmented to allow several transforms to be loaded at once; see column 7, lines 51-60. Thus the CPU (104) must process in parallel so that several transform can be loaded at once.

As to claims 10-11, the limitations recited in claims 10-11 are met by Zimmermman (see column 5, lines 20-46) and the prior art by Juday. For example, Juday clearly teaches a pan function.

6. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman and Nayar in view of Juday as applied to claim1 above, and further in view of Nobutoshi (JP 06-295333).

As to claims 5, note the discussion of Zimmerman, Nayar and Juday above, Nobutoshi further teaches the optical system including a hyperboloidal mirror having a hyperboloidal shape of one sheet of a two sheeted hyperboloid (see constitution and see paragraph 0020). Nobutoshi teaches a rotation axis of the hyperboloidal mirror being identical with an optical axis of an imaging lens included in the imaging section and a first principal point of the imaging lens being located at a focal point of the hyperboloidal mirror (see figure 1 and see paragraphs 0019-0028). Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to have used a hyperboloidal mirror having a hyperboloidal shape of one sheet of a two sheeted hyperboloid as taught by Nobutoshi so as to reduce distorted picture (see paragraph 01250).

As to claim 6, Nobutoshi clearly teaches first and second mirrors as recited in the claim (see Figure 2 and Figure 7).

Response to Arguments

7. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

In view of amendment and argument, the reference of Nayar has been added for new ground of rejection.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chanh Nguyen whose telephone number is (703) 308-6603.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Saras, can be reached on (703) 305-9720. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 9703) 306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist)

CN
C.Nguyen

January 24, 2004

Chanh Nguyen
CHANH NGUYEN
PRIMARY EXAMINER